

**Green, Energy & Environment Audit Report  
Narsee Monjee College of Commerce and Economics, Mumbai**

# **Report**

**On**

## **GREEN, ENERGY & ENVIRONMENT AUDIT**

**For**

**Shri Vile Parle Kelavani Mandal's  
Narsee Monjee College of Commerce and Economics  
Mumbai**

**Prepared**

**By**

**Senergy Consultants Pvt Ltd  
Mumbai**

**June 2024**

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# **I**

## **Introduction**

Green & Energy Audit was undertaken at SVKM's Narsee Monjee College of Commerce and Economics, Bhagubai Mafatlal Complex, Swami Bhaktivedant Marg, Vile Parle West, Mumbai, Maharashtra 400056 during the month of June 2024.

The organization is very keen to promote green culture wherever possible, as a commitment towards a better environment and conservation of energy. A lot of effort has already been put up to bring down the carbon footprint. To further optimize consumption and identify saving opportunities, M/s Senergy Consultants was assigned to carry out Green & Energy Audit of the premises.

This Audit Report presents the analysis of the data collected, observations made at the facility and is governed by the objectives, scope of work, methodology etc. discussed in the ensuing paragraphs.

### **Team:**

The team members of the audit study.

- Mr. Ravindra Datar
- Mr. Nitesh Kharche
- Mr. Chaitanya Rakh
- Mr. Vikas Kharatmol

### **Acknowledgment:**

We wish to express our gratitude towards Dr. Parag Ajgaonkar (Principal), Dr. Savita Desai (Vice Principal), Ms. Geeta Desai (Vice Principal) and Dr. Heena Bhuva (Vice Principal) for having given us the opportunity for conducting the study and the support provided during the study.

We are also thankful to Ms. Tessy Phili (NAAC Criteria 7 In Charge) & Ms. Vaishali Kurhekar (NAAC Criteria 7 Developer) and Dr. Ruchi Agarwal (NAAC Criteria 7 Developer) for extending necessary help and co-operation from their side.

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## II

# Executive Summary

The premises were evaluated against the various criteria laid down by the National Assessment and Accreditation Council (NAAC). The major observations are.

### Air Quality & Ventilation

- The classrooms and other areas are well ventilated to ensure proper air quality.
- The fans are appropriately installed to ensure proper air circulation.
- Indoor as well as outdoor plants have also been provided to improve the environment.
- The air-conditioned rooms are provided with proper ventilation and fresh air.

### Lighting System

- The usage of natural light is optimized through well designed structure and windows.
- Most of the light fittings are provided with high efficiency LED lamps.
- It is suggested to automate the switching of lamps in common areas and rest rooms with sensor-based control.

### Green Campus Initiative

- The movement of vehicles inside the campus is restricted with vehicles of Staff and students are allowed to enter the campus with designated parking area.
- The usage of plastic is almost (70%) banned inside the campus.
- The campus is surrounded by a lot of greenery, trees, and proper landscaping.
- The college has an internal committee for conservation of resources like energy and water.

### Environment & Energy Initiative

- The college has formed internal committees and the Green Club for promoting environmental and conservation activities.
- The college has carried out various Beach Clean-up Drives and several other activities inside and outside the campus.

### Water Quality & Conservation

- The water is supplied by the Municipal corporation is used only for drinking & other applications like toilets, washing of utensils and other requirements.
- Water purifiers & coolers are provided at convenient locations and on each floor.
- The rainwater harvesting pit is provided for ground water recharge.
- The distribution network and piping are satisfactory and adequate.
- The toilets are provided with water efficient (low usage) fittings.

### Waste Management

- The sewage / effluent water is discharged in the common municipal drain, which is a common practice in and around Mumbai & Navi Mumbai.
- The electronic gadgets / waste may be donated if useful or handed over to appropriate waste collectors.
- The general solid waste is disposed through municipal corporation.
- It is suggested to install a compost pit to manure organic waste.

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### **Air Conditioning System**

- The Air Conditioners are operated as required with manual control. The operation is minimal consequently automation may not be economical.
- The room temperature is maintained at 24 to 25 °C, which is well within the recommended values.
- The Air Conditioners are serviced regularly and properly maintained.
- It is suggested to procure energy-efficient Air Conditioners units with a 5-star rating.

### **Infrastructure usage**

- The special toilet is available to address the needs of specially abled people.
- Ramps are provided on the ground floor to address the needs of specially abled people.
- There were no seepages observed in the building premises.
- The on-campus movement is distributed with multiple entrances as well as staircases.
- There is adequate fire extinguishers located at key areas.
- The draining system for washrooms is efficient and effective.

### **Green IT culture**

- Energy efficient computers and laptops have been procured.
- Electronic communication is encouraged to minimize usage of papers.
- Most of the papers are reused for doubled sided printing to further minimize usage of paper.

### **Renewable Energy**

- The possibility of installing Solar Photovoltaic System with NET metering may be assessed to meet part of the electricity consumption.
- The quantity of plate waste (organic waste with higher starch contents) is negligible, consequently, there is no potential for biogas generation.
- There is no application of solar thermal system, and it does not find attractive in this case.

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### III

## Electrical Gadget

#### Lamps:

Location	LED	Operation	
		Hr/D	D/M
Ground Floor			
Lift Lobby Area	22	10	25
Reception Area	43	10	25
Passage Area	43	10	25
Xerox Room Lobby	3	10	25
Xerox Room In	4	10	25
Notice Board Inside	12	10	25
Common Staircase	3	10	25
Toilet Corridor	10	10	25
Boys Washroom	19	10	25
Girls Washroom	16	10	25
Medical Room	4	10	25
BMS Lobby Area	2	10	25
BMS Room	4	10	25
FM/HM Lab	34	10	25
Workshop	50	10	25
MT & CT Lab	25	10	25
Both Side Counter	5	10	25
Admin Office	122	10	25
Security Cabin	4	10	25
Compound Area	10	10	25
First Floor			
Tutorial Room 101	12	10	25
Tutorial Room 102	12	10	25
Cr-101	24	10	25
Cr-102	24	10	25
Cr-103	24	10	25
Faculty 101	8	10	25
Faculty 102	8	10	25
Chemistry Lab	30	10	25
Physics Lab	30	10	25
Boys Washroom	16	10	25
Girls Washroom	16	10	25
Toilet Corridor	7	10	25
All Handicap Washroom	6	10	25
Lift Lobby Area	12	10	25
Bee Lab	20	10	25

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Location	LED	Operation	
		Hr/D	D/M
Faculty 103	12	10	25
HOD Cabin	4	10	25
Cr-104	20	10	25
Computer Room	20	10	25
A.P.M Lab	24	10	25
Drawing Hall	47	10	25
Cr-105	11	10	25
Cr-106	20	10	25
Cr-107	20	10	25
Cr-108	21	10	25
All Passage Area	30	10	25
Server Room	4	10	25
<b>Second Floor</b>			
Lift Lobby Area	27	10	25
Toilet Corridor	10	10	25
Boys Washroom	14	10	25
Girls Washroom	18	10	25
Handicap Washroom	2	10	25
Lab-3	20	10	25
Control Lab-1	19	10	25
Ahu Corridor	15	10	25
Control Lab-2	21	10	25
Communication Lab	24	10	25
Lab-4	22	10	25
Analog Lab	22	10	25
HOD Cabin North	4	10	25
Faculty Cabin 1,2,3,4	8	10	25
Cr-204	22	10	25
Cr-205	24	10	25
Cr-206	24	10	25
Cr-207	22	10	25
All Passage Area	38	10	25
Electrical Machine Lab	22	10	25
System Power Lab	20	10	25
HOD Cabin South	4	10	25
Faculty 201	8	10	25
Faculty 202	8	10	25
Cr-201	23	10	25
Cr-202	19	10	25
Cr-203	19	10	25
Computer Lab-1	22	10	25
Computer Lab-2	21	10	25
Notice Board North + South	26	10	25

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Location	LED	Operation	
		Hr/D	D/M
Notice Board Inside	8	10	25
Server Room	2	10	25
<b>Third Floor</b>			
Server Room	2	10	25
Passage Area	56		
NM Faculty Room	26	10	25
Ahu Corridor	11	10	25
Notice Board North + South	18	10	25
Toilet Corridor	10	10	25
Boys Washroom	16	10	25
Girls Washroom	18	10	25
Lift Lobby Area	27	10	25
Handicap Washroom	2	10	25
Cr-301	28	10	25
Cr-302	28	10	25
Cr-303	24	10	25
Hardware Lab	22	10	25
Mqc Lab	22	10	25
Thermal Power Lab	22	10	25
Both HOD Cabin North Side	8	10	25
Faculty 301	8	10	25
Faculty 302	8	10	25
Refrigeration Lab	22	10	25
Notice Board Inside	4	10	25
Cr-304	23	10	25
Gym Khana	46	10	25
G.E Lab	22	10	25
Environment Lab	22	10	25
Dh-301	26	10	25
Assessment Lab	23	10	25
Examination Room	27	10	25
HOD Cabin South Side	4	10	25
Faculty Cabin 1,2,3,4	8	10	25
<b>Fourth Floor</b>			
Lift Lobby Area	27	10	25
Cr-401	28	10	25
Cr-402	28	10	25
Machine Lab	28	10	25
Software Lab	28	10	25
Plastic Lab	28	10	25
Plastic Testing Lab	28	10	25
Toilet Corridor	10	10	25
Both HOD Cabin North Side	8	10	25

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Location	LED	Operation	
		Hr/D	D/M
Faculty 401	10	10	25
Faculty 402	10	10	25
All Passage Area	54	10	25
Glass Cabin 1,2,3,4 South Side	8	10	25
NM Faculty Staff	10	10	25
Ahu Corridor	23	10	25
Tom Lab	24	10	25
Girls Common Rom	46	10	25
Process & Control Lab	32	10	25
Mechanical Lab	22	10	25
Chemical Reaction Lab	22	10	25
Cr-403	25	10	25
Cr-404	24	10	25
Cr-405	24	10	25
Cr-406	25	10	25
Server Room	2	10	25
Notice Board Inside	4	10	25
Notice Board North + South	15	10	25
Boys Washroom	16	10	25
Girls Washroom	19	10	25
Handicap Washroom	2	10	25
<b>Fifth Floor</b>			
Lift Lobby Area	27	10	25
Boys Washroom	16	10	25
Girls Washroom	19	10	25
Handicap Washroom	2	10	25
Server Room	2	10	25
Toilet Corridor	10	10	25
Notice Board North + South	15	10	25
Notice Board Inside	5	10	25
All Passage Area	69	10	25
Ahu Corridor	6	10	25
Baggage Counter	4	10	25
Reading Staff Room	23	10	25
Library Glass Cabin	8	10	25
Administration Glass Cabin	4	10	25
Library	28	10	25
Seminar Hall	44	10	25
Faculty 501	8	10	25
Faculty 502	10	10	25
Student Reading Room	66	10	25
Nm Office	46	10	25
E-Library	18	10	25

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Location	LED	Operation	
		Hr/D	D/M
Computer Lab 6	28	10	25
Programming Lab	28	10	25
Web Technology Lab	32	10	25
Cad-Cam	28	10	25
System Software Lab	32	10	25
Networking Lab	28	10	25
Nm Principal Cabin	4	10	25
Vice Principal Cabin	4	10	25
<b>Sixth Floor</b>			
Lift Lobby Area	27	10	25
Boys Washroom	16	10	25
Girls Washroom	19	10	25
Handicap Washroom	2	10	25
Server Room	2	10	25
Toilet Corridor	10	10	25
Cr 13	32	10	25
Cr 14	34	10	25
Cr 15	28	10	25
Cr 16	39	10	25
Cr 17a	14	10	25
Cr 17b	20	10	25
Cr 18a	14	10	25
Cr 18b	14	10	25
Cr 19	36	10	25
Cr 20	30	10	25
Cr 21	33	10	25
Cr 22	34	10	25
Cr 23	40	10	25
Cr 24a	12	10	25
Cr 24b	14	10	25
Passage Glass Cabin South	4	10	25
Ahu Corridor	6	10	25
<b>Seventh Floor</b>			
Lift Lobby Area	27	10	25
Boys Washroom	16	10	25
Girls Washroom	19	10	25
Handicap Washroom	2	10	25
Server Room	2	10	25
Toilet Corridor	10	10	25
All Passage Area	34	10	25
Cr 1	32	10	25
Cr 2	37	10	25
Cr 3	34	10	25

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Location	LED	Operation	
		Hr/D	D/M
Cr 4	38	10	25
Cr 5a	14	10	25
Cr 5b	20	10	25
Cr 6a	14	10	25
Cr 4b	14	10	25
Cr 7	35	10	25
Cr 8	38	10	25
Cr 9	32	10	25
Cr 10	34	10	25
Cr 11	40	10	25
Ahu Corridor	6	10	25
Cr 12a	14	10	25
Cr 12b	14	10	25
<b>Basement 1</b>			
Lift Lobby Area	27	10	25
DJ Workshop	37	10	25
Svkm Store	13	10	25
Canteen	57	10	25
Canteen Dishwash Area	2	10	25
Parking Area	20	10	25
Ramp Area	8	10	25
<b>Basement 2</b>			
Lift Lobby Area	27	10	25
Parking Area	40	10	25
Ramp Area	8	10	25
Lt Pannel Room	10	10	25
<b>Basement 3</b>			
Lift Lobby Area	27	10	25
Parking Area	49	10	25
Pump Room	6	10	25
Stp Plant Room	1	10	25
<b>Terrace Area</b>			
Chiller Plant Room	5	10	25
Hvac Panel Room	2	10	25
Hitachi Machine Room	8	10	25
Mitsubishi Room	4	10	25
Cooling Tower Area	2	10	25
<b>Total</b>	4661		

Abbreviations:

LED: Light Emitting Diode Lamp

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**Observations and Recommendations:**

- The illumination level is generally as per the norms; the illumination level is higher mainly due to usage of daylight.
- The use of daylight has been maximized through windows.
- The lamps are strategically located to optimize usage of daylight.
- The practice of switching off the lamps in the unoccupied areas has been followed.
- Almost all the light fittings are provided with high-efficiency LED lamps.

**Air Conditioners:**

Sr No	Location	Quantity
1	First Floor	1
2	Second Floor	1
3	Third Floor	1
4	Fourth Floor	1
5	Fifth Floor	1
6	Sixth Floor	1
7	Seventh Floor	1
<b>Total</b>		<b>7</b>

**Observations:**

- The air conditioners are switched off, when not in use.
- The temperature is maintained at 24 to 25 °C for air conditioning spaces, which is within the recommended values.
- The Air Conditioners are operated as required with manual control.
- The overall condition of indoor as well as outdoor units is satisfactory.
- It is suggested to procure energy efficient machines of 5-star rating while making new purchases.

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**Electricity Bill:**

<b>Consumer Name:</b> Shri Vile Parle Kelwani Mandal
<b>Tariff Category:</b> HT V (B)
<b>Meter No.:</b> SH000897
<b>Consumer No.:</b> 9000 0118 8174
<b>Contract Demand:</b> 2000kVA Since' Nov 24
Maharashtra State Electricity Distribution Co. Ltd.

Description	Unit	May-23	Jun-23	Jul-23	Aug-23	Oct-23	Nov-23
Energy Consumption	KWH	287169	274861	338618	458108	466249	356630
	KVAH	287860	275660	340320	464660	476640	361620
Bill	Rs	3420357.6	3312546.3	4209594.2	5548833.7	5762037.2	4411123.9
Cost	Rs/KWH	11.91	12.05	12.43	12.11	12.36	12.37

Description	Unit	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	Average
Energy Consumption	KWH	151830	382980	393120	417150	450090	359034
	KVAH	152940	385170	396030	419670	452970	361356
Bill	Rs	1538899.0	4199722.0	4294787.0	4634448.0	6490613.0	4231693.0
Cost	Rs/KWH	10.14	10.97	10.92	11.11	14.42	11.79

**Observations:**

- The average cost of the power is around Rs 11.79/- per kWh.

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## IV Environmental System

### Ventilation & Air Quality:

- The air ventilation is adequate.
- Several indoor & outdoor plants have been installed to improve air quality.



### Indoor & Outdoor Plants:

Sr No	Description	Quantity
1	Canna Verigated	110
2	Dracaena Mahatma	170
3	Croton Petra	170
4	Canna Verigated (Lily)	150
5	Dracaena Mahatma (Laal Dodga)	185
6	Croton Petra (Pentena)	205
7	Kardali	50
8	Betel Leaf (Jimbar Paan)	7
9	Guava Tree	1
10	Peace Lily	1
11	Climber	1
<b>Total</b>		<b>1050</b>

- Many of the lamps are replaced with LED, especially those working for longer period.

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- Natural light is been used for maximum illumination during daytime.
- It has been general practice to switch off the fans & lights in an occupied area.
- It is suggested to install a sensor-based auto On-Off system to optimize power consumption.



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# V

## Water Management

### Water Source:

The water supplied by the municipal corporation is used only for drinking & Well water is used for other applications like toilets, washing of utensils and other requirements.

The incoming water from the municipal corporation is metered.



The consumption pattern was analyzed by the water bills. The details are as under.

Period	Days	Consumption	Bill Amount	Cost
		KL	Rs	Rs/KL
Connection No- KWD2900009				
18-08-2023 to 18-09-2023	30	3798	40232	10.59

### Observations:

- The average water consumption is generally within the norms

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### Water Coolers & Purifiers:



Water purifiers & coolers are provided at individual floors and convenient locations, the details are as under.

Sr No	Location	Quantity
1	First Floor	2
2	Second Floor	2
3	Third Floor	2
4	Fourth Floor	2
5	Fifth Floor	2
6	Sixth Floor	2
7	Seventh Floor	2
8	Basement 1	1
<b>Total</b>		<b>15</b>

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**Rainwater Harvesting:**



The rainwater is fed to the rainwater harvesting pit for ground water recharge.

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## VI Waste Generation & Management

### Sewage & Wastewater:

The sewage is fed into the municipal drainage. This is a common practice and the municipal corporation which charges towards the sewage charges.

### Solid Waste:

- The waste is segregated and disposed of through the municipal disposal system.
- The dustbins for Recyclable waste and Non-Recyclable Waste have been provided at appropriate locations.
- The organic waste may be converted into manure by installing composting pit.
- The electronic gadgets with residual life may be donated while the electronic waste is properly segregated and handed over to appropriate scrap collectors.



Organic as well as inorganic waste is segregated in the college premises.

Inorganic waste is collected in garbage bins and disposed of through the Municipal system.

### Electronic Waste:

- The electronic gadgets / waste may be donated if useful or handed over to BMC authorized E-Waste Collection Vendor.

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## VII Infrastructure & Safety



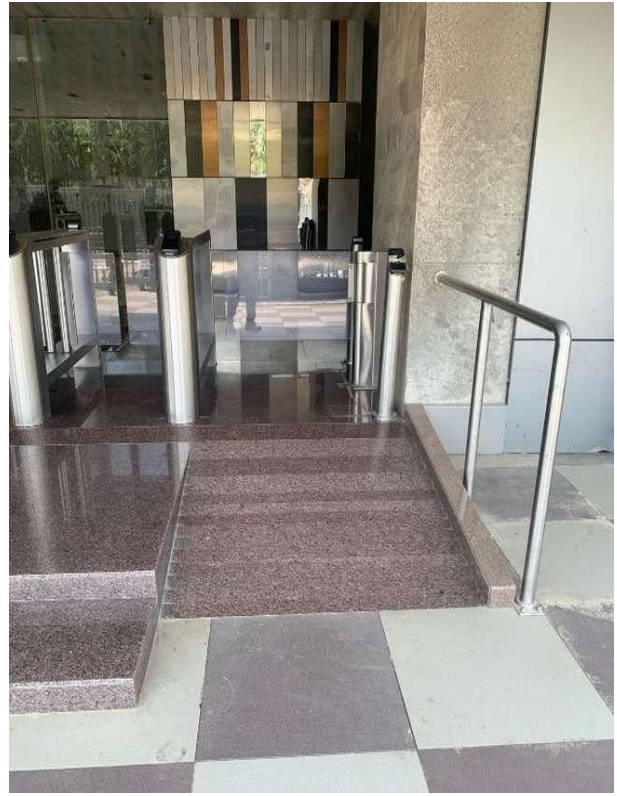
### **Movement on-campus (Distributed / non-distributed leading to crowds)**

- The premises are provided with multiple staircases with necessary entrances to ensure quick and effective movement in normal as well as emergency conditions.
- The movement of vehicle inside the campus is restricted with vehicles of Staff and Special Dignitaries are allowed to enter the campus with designated parking area.
- The usage of plastics is almost banned (70%) inside the campus.
- Ramp is available for differently abled student along with special toilet dedicated for them.

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**Firefighting & fire escape system:**



There are efficient fire extinguishers in the premises, which are checked / refilled as per the stipulated frequency.

The premise is provided with multiple staircases with requisite entrances to ensure quick and effective movement in emergency conditions.

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**Parking space:**



There is adequate parking space for vehicles/four wheelers. However, almost all the students and many of the faculty members avail public transport system which is very convenient due to proximity to railway station and bus services.

**Draining system:**

The drains from the washrooms are connected to the municipal drainage, which is a common practice in the colleges in and around Mumbai.

The municipal corporation charges for water disposal.

**Seepage in the building:**

The premise was visually inspected for seepages.

No seepage was observed in any of the places.

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## VIII Green Culture

### Computers/Laptops:

1. The LED / LCD monitors & Laptops has been procured, which are energy efficient.
2. These monitors are not only energy efficient but also generate minimal heat and cut down on air conditioning load.



The following steps may be initiated to further enhance the efficiency of the systems.

1. An efficient power management system may be incorporated to
  - a. Switch off the display if not in use.
  - b. Put the computer in Sleep mode / switching off the machines, if not used for prolonged period.
2. Optimize brightness of the screen.
3. Discourage use of screen savers, which has similar power consumption.

### Paper-less communication:

The major internal as well as external communication is through electronic medium.

### Re-using one sided paper for printing:

It was observed that two side printing / printing on the back side of used paper in more than 80% of the cases.

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**Green Initiative:**

1. The Beach Clean-up Event held on September 29, 2023, was a commendable effort to contribute to the ecological conversation and combat beach pollution.



2. On September 29, 2023, students of the institute carried out Beach Clean-up Drive at Mumbai Coastal Road.



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## IX Renewable Energy

### **Solar Photovoltaic:**

It is suggested to install rooftop solar panels with net metering for captive usage.

### **Solar Thermal:**

There is no application for a solar thermal system, and it is not find attractive in this case.

### **Biogas Plant:**

There is no possibility of installing a biogas plant for cooking as the quantity of plate waste is negligible.

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